



JUNE 28 - 30, 2005 NORFOLK CONVENTION CENTER

Current IP Migration Efforts and The Future Network Vision

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Communications and Networking Session

Sponsored by
SPAWARSYSCOM
FORCEnet Chief Engineer





ADNS TODAY and TOMORROW



- **Today's NAVY WAN:**
 - **Single Path Access, No Restoral, Best Effort, Limited BW, No Guarantee's**
 - **No Network "Insight", Little Visibility, Limited Decision Making Tools**
- **The NAVY's Future WAN will be:**
 - **Bandwidth Efficient, Possess Multiple Survivable Paths, Contain Quality of Service Guarantee's and Provide Network Visibility to Remote/Local Users.**

ADNS is the NAVY's POR for WAN Networking and The Mechanism to Accomplish this Vision



Increment I ADNS Provides:



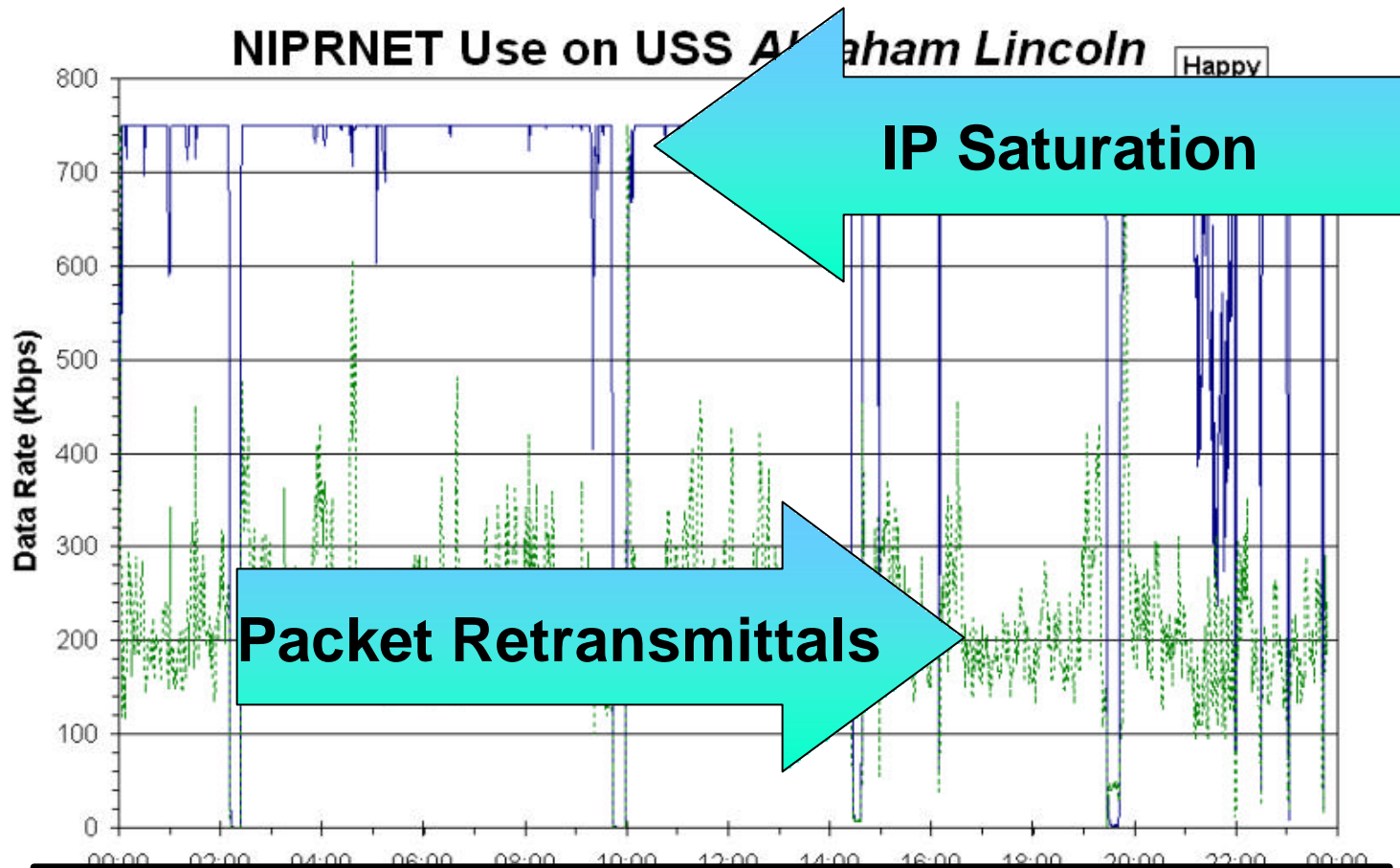
- Limited Bandwidth
 - 512 or 768 IP Kbps to a US Navy Carrier
 - 128 IP Kbps to a DDG/CG
 - 32 IP Kbps (Shared)
- Afloat Units Maintain IP Connectivity (Single T1)
- Ships Limit Capability to Maximize IP Capability – Legacy Implementation
- Network Performance Issues Isolated via Manual Voice Circuits Subject to Operator Intervention

**Roadrunner
Provides
T1 to a Single Residence**

**INCREMENT I Solved 1998 Issues,
Now Obsolete**



Incr I NIPRNET BW: 768 Kbps allocation



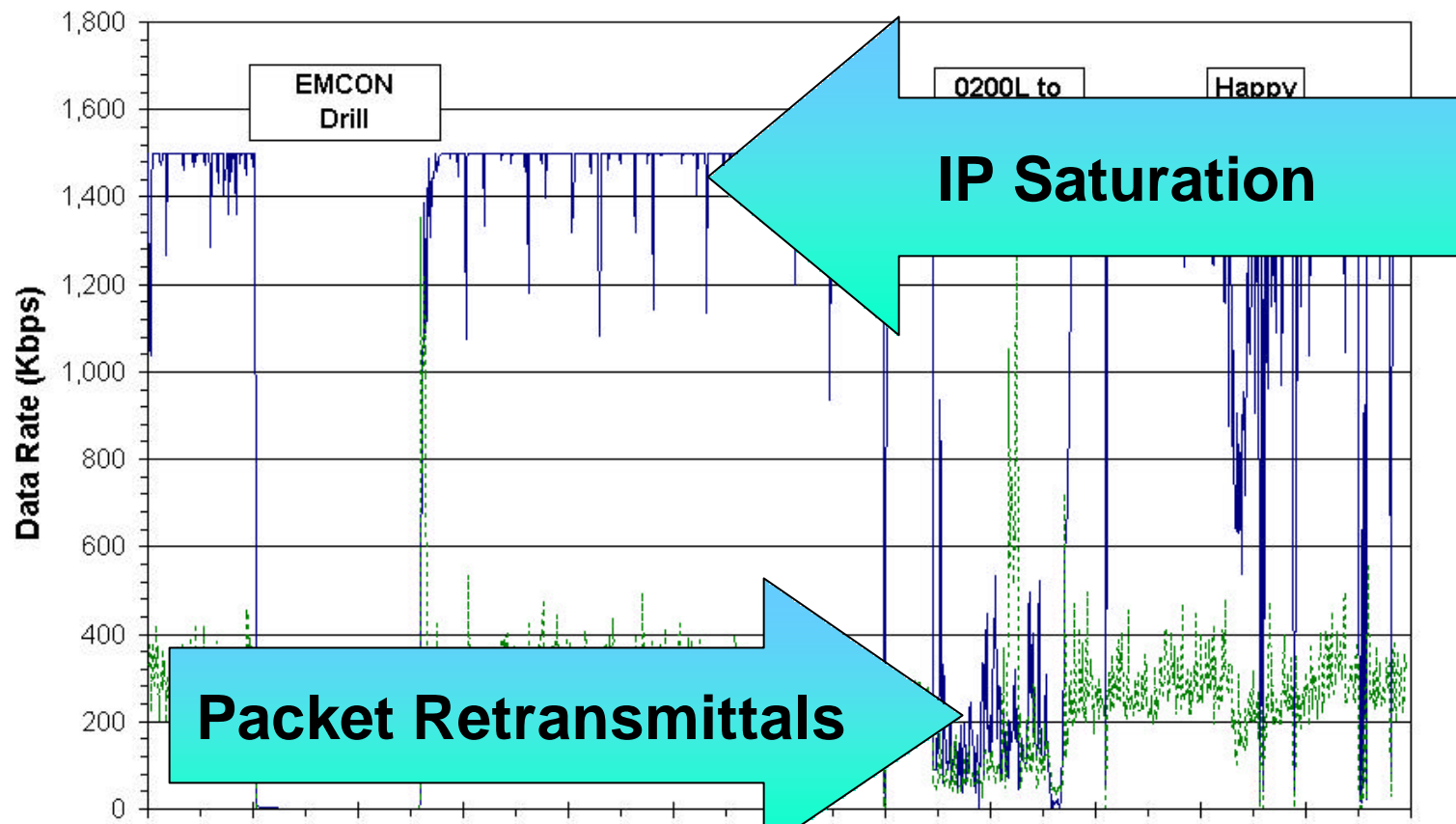
**Increment I Does not Provide a BW
Efficient Architecture**



Incr I NIPRNET BW: 1,544 Kbps allocation



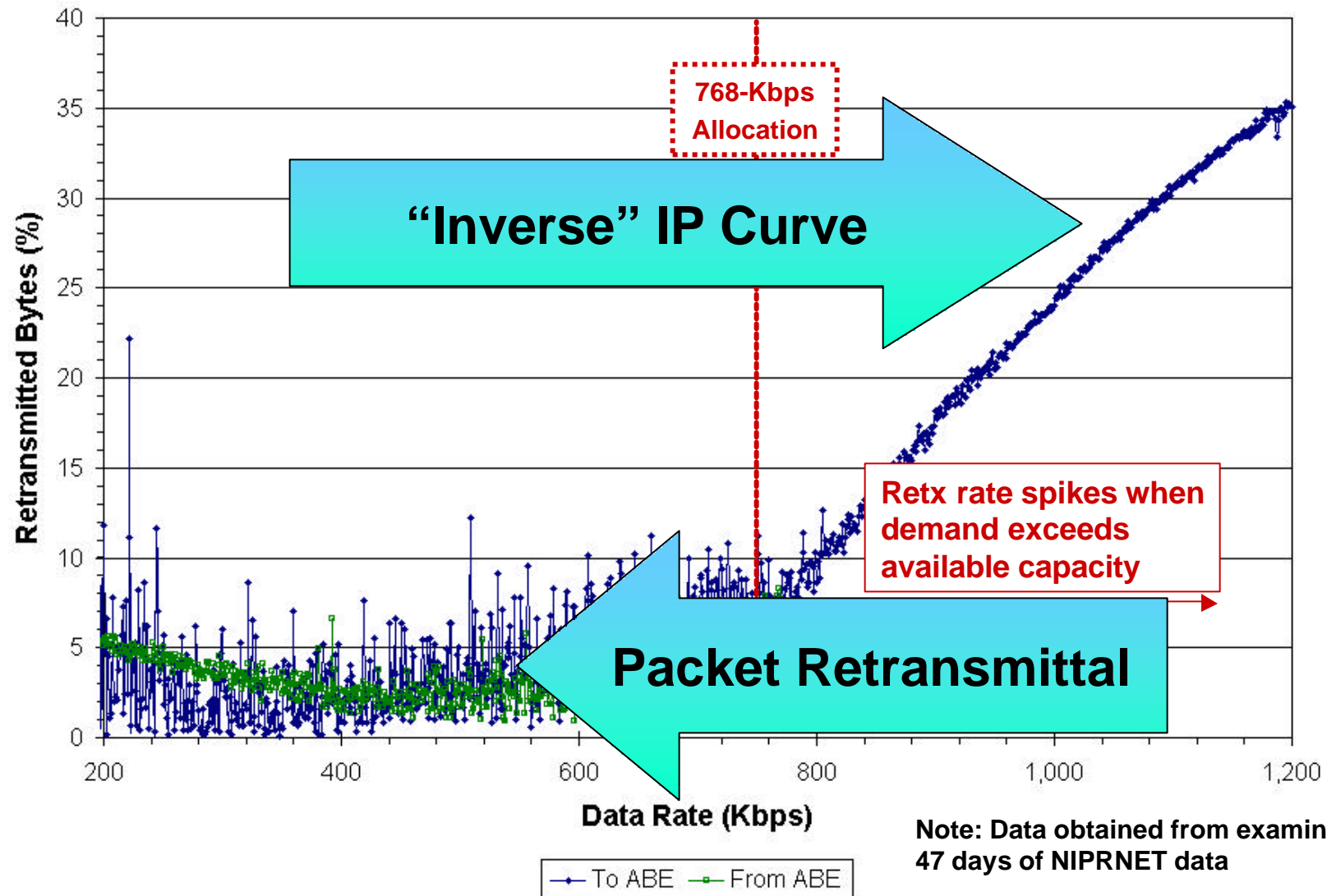
NIPRNET Use on USS *Abraham Lincoln*



**Increment I Does not Provide a BW
Efficient Architecture**

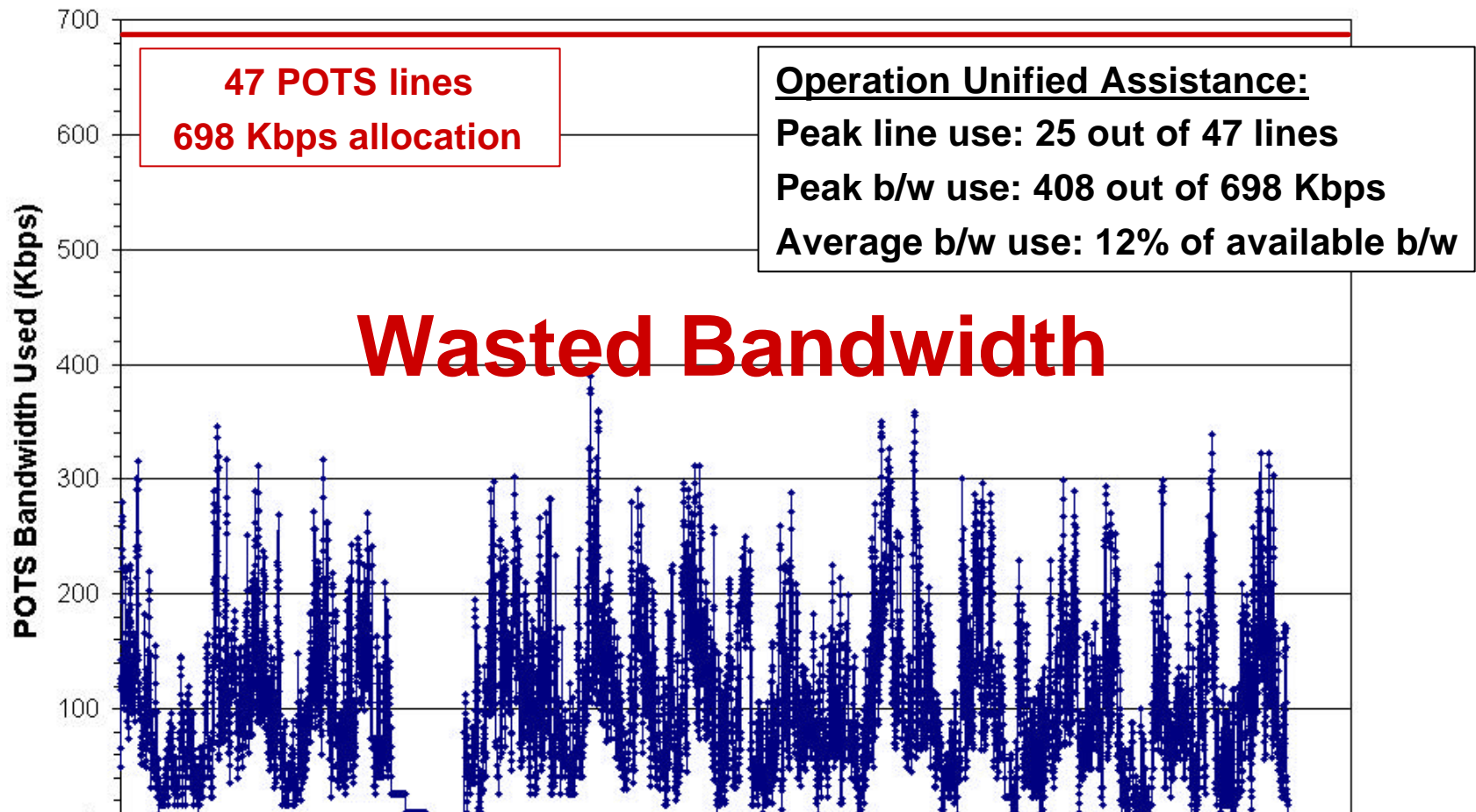


Incr I NIPRNET BW: Typical Shipboard Environment





Incr I Typical POTS USE



Voice is not the Only Culprit – Serial Data and VTC Circuits Consume Major Portions of Static BW

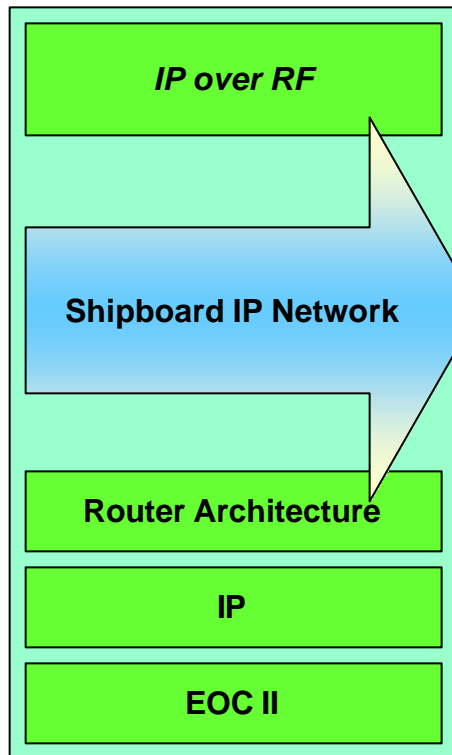


ADNS Increments



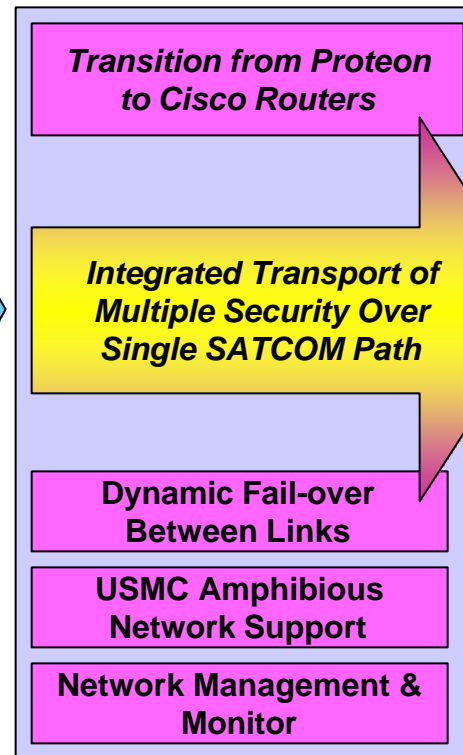
Pre Incr I

1988-1997



Increment I

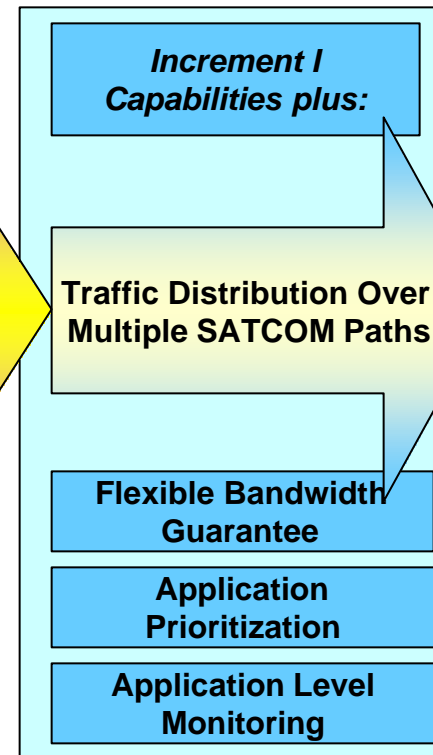
1997-2005



AN/USQ-144B(V)2/4
AN/USQ-144C(V)2/3/4
AN/USQ-144D(V)1/2/3/4
AN/USQ-144E(V)2/4
AN/USQ-144F(V)2
AN/USQ-144G(V)2/4
AN/USQ-144(V)5

Increment II

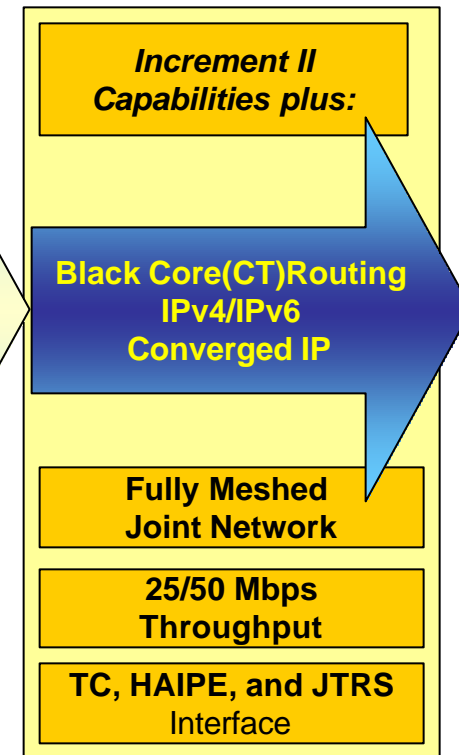
2005-2008



AN/USQ-144D(V)1
AN/USQ-144H(V)2/4
AN/USQ-144J(V)2/4

Increment III

2008



TBD



Incr II BW Guarantees

JCA & Unclass via CWSP (1024 kbps)
Secret via DSCS (512 kbps), SI via EHF (384 kbps)



Data Throughput
Rate

1200000
1000000
800000
600000
400000
200000
0

Higher Priority Imagery Traffic
starts and NIPR Declines

Traffic Classes
Provide "Reusable"
Bandwidth
Performance
Guarantee

Higher Priority Traffic
Ends and NIPR Expands

Timescale

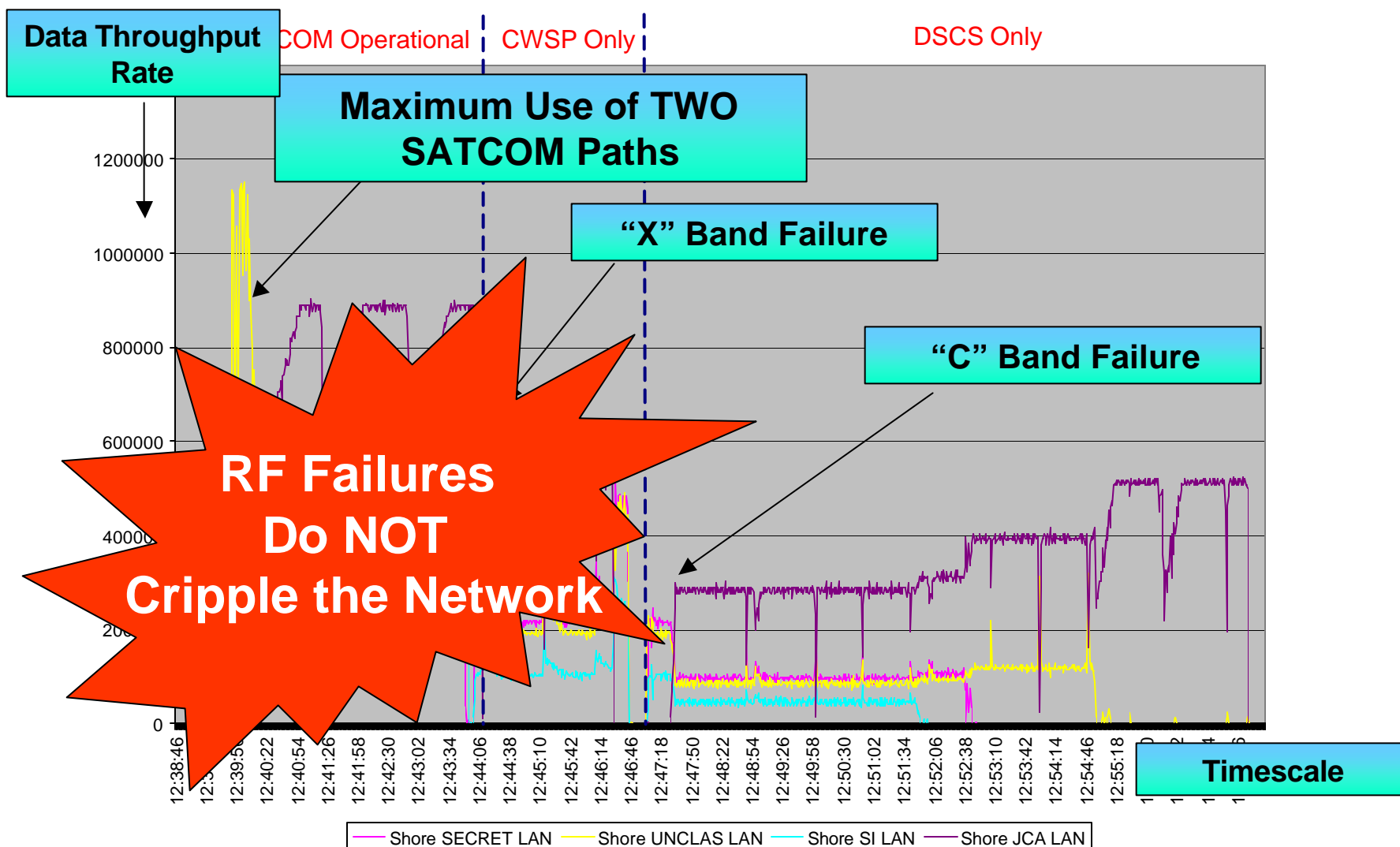
9:51:01 9:51:36 9:52:11 9:52:46 9:53:21 9:53:56 9:54:31 9:55:06 9:55:41 9:56:16 9:56:51 9:57:26 9:58:01 9:58:36 9:59:11 9:59:46 10:00:21 10:00:56 10:01:31 10:02:06 10:02:41 10:03:16 10:03:51 10:04:26 10:05:01 10:05:36 10:06:11 10:06:46 10:07:21 10:07:56 10:08:31 10:09:06 10:09:41 10:10:16 10:10:51 10:11:26

Shore SECRET LAN Shore UNCLAS LAN Shore SI LAN Shore JCA LAN



Incr II Restoral

JCA & Unclass via CWSP (1024 kbps)
Secret (512 kbps) via DSCS, SI via EHF (384 kbps)





Incr II SIPR Application Prioritization



**US NAVY Initial
“True” QOS
Implementation**

**Determination
of Priority is a
“Warfighter”
Input
– CONOPS and
DOCTRINE**

Application or Traffic Types	DSCP	Class
Routing Overhead	8	CS6
Interactive Voice	6	EF
Reserved for		21
		AF 22
GOCS		AF 23
Mission		AF 23
W		AF 11
En	12	AF 12
Bulk Data (FTP)	14	AF 13
Default	00	00
Scavenger (Oracle, CST, CaS, TBMCS)	02	02

**“Binning” Applications
Provides Means of
QOS Policing**



Incr II NIPR Application Prioritization



**QOS Must be
ENFORCED at
the POINT Of
CONGESTION
ADNS**

**APPLICATION
Characterization in
terms of Duty Cycle,
Surge Requirements,
Jitter, Delay, Latency
Requirements Must
be Understood**

Traffic Class	DSCP	Class
Routing Overhead	8	CS6
		AF 22
Crit_W		AF 11
En	12	AF 12
Medical	14	AF 13
Default traffic	0	default
Web & SSL	02	02

**“Binning” Applications
Provides Means of
QOS Policing**



ADNS Inc III Capabilities

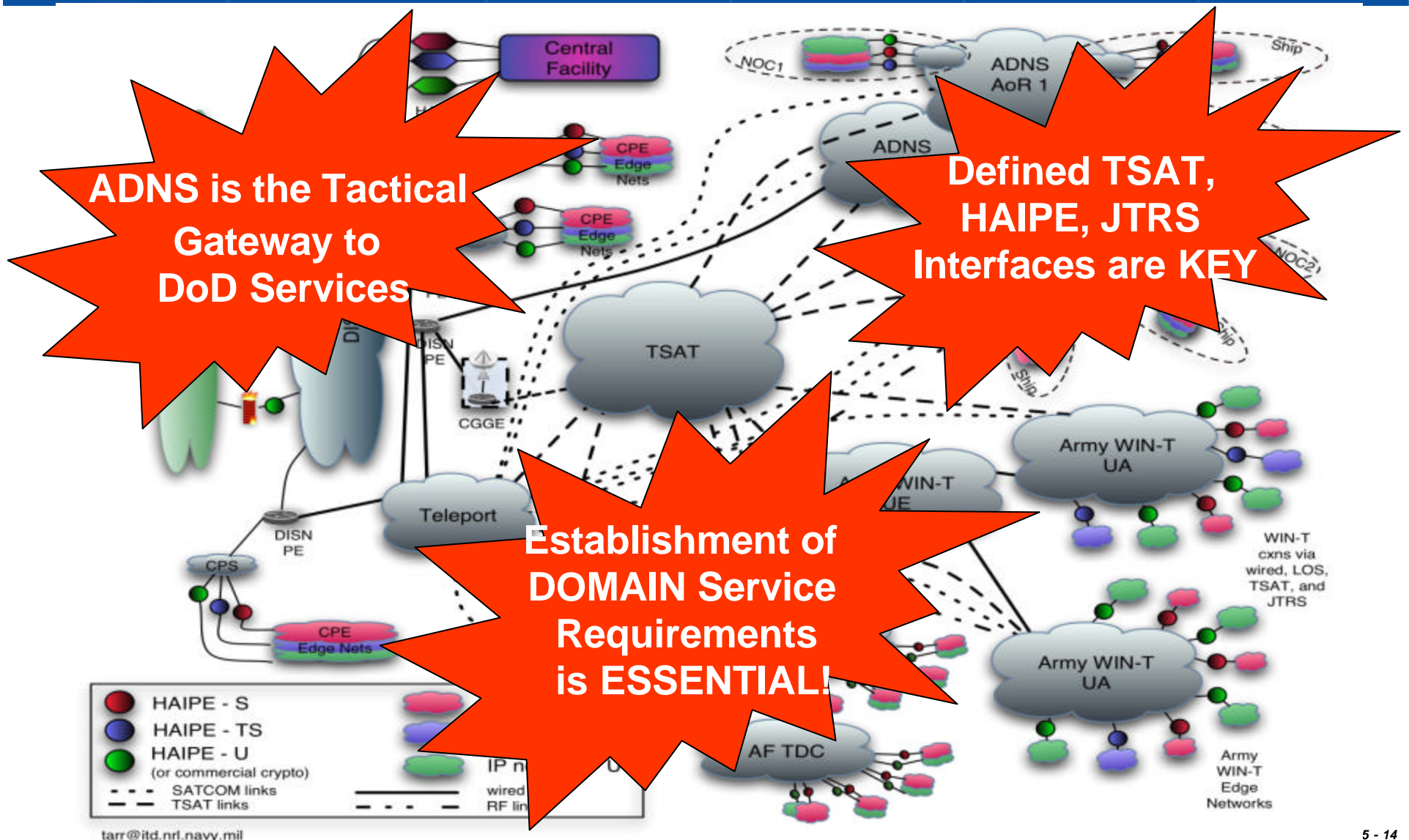


– Future Increment III Systems will support:

- 25/50 Mbps Tactical Throughput Capability
- A Fully Meshed Network
- Support for Real Time Mission Critical Applications requiring increased factors of Network Reliability and Availability
- Network Capable of Supporting both IPv4 and IPv6 Applications
- Support for Dynamic QOS and Dynamic Bandwidth Allocation
- Support for Mobile Ad Hoc networking
- Support for Multi-Cast Applications
- Align with the Navy Tactical WAN with the DoD GIG across a Black Core Backbone



NOTIONAL VIEW OF Incr III GIG IP CONNECTIVITY





External Working Group Participation



- Support the various DoD/DISA/Joint Working Groups. To name a few:
 - DoD GIG QOS WG
 - DoD VoIP IA WG
 - DoD E2E Systems Engineering WG
 - JNIP (JTRS Joint Networking IP WG)
 - WIN-T ICWG
 - GIG Network Mgmt and Control (NeMAC) WG
 - GIG IA Transition Strategy WG
 - GIG Routing Working Group (GRWG)
 - TELEPORT AofA IPT WG's
 - ICWG (US Army)
 - HAIPE



Summary



**ADNS is the Tactical Navy
“Gateway” to the GIG**

**The Interaction Between the ADNS
“Domain” and Other Domain Users
is Key to Architectural
Development**